

CLAIMS

What is claimed is:

1. A method of providing comparative cost information for health insurance plans comprising the steps of:

incorporating parameters of health plans;

assembling recent health care use and cost data for a reference population;

5 acquiring personal and health information from users on themselves and their household members;

estimating the distribution of out-of-pocket costs the user and his/her household is likely to face in the coming year in various health plans, based on the experience of comparable households in the reference population; and

10 outputting premium and estimated out-of-pocket expenses.

2. The method as in claim 1 of providing comparative cost information for health insurance plans further comprising the step of:

providing costs for a “worst-case” scenario.

3. The method as in claim 2 of providing comparative cost information for health insurance plans further comprising the steps of:

outputting out-of-pocket costs for an individual for particular medical conditions and health events with “in-network” treatment; and

5 outputting out-of-pocket costs for an individual for particular medical conditions and health events with “out of-network” treatment.

4. The method as in claim 3 of providing comparative cost information for health insurance plans further comprising the steps of:

outputting cost data based upon various factors including all “in-network” treatment and all “out-of-network” treatment;

5 outputting cost data based upon various factors including expected very high, high, moderate, low and no usage of health care; and

including said parameters of health plans such as individual and household deductibles, coinsurance and co-payments, individual and household stop-loss provisions, and services covered and not covered.

5. A computer-based method of providing comparative cost information for health insurance plans comprising the steps of:
- processing data with a central processing unit;
 - storing data on a mass storage device;
 - 5 storing data and commands in volatile memory;
 - incorporating parameters of health plans;
 - assembling recent claims cost data for each health plan;
 - generating claims-level files for a reference population;
 - acquiring user's household members' health and personal information;
 - 10 comparing household members health and personal information to reference population;
 - outputting cost data for household members based on said comparison;
 - outputting cost data based upon various factors including expected very high, high, moderate, low and no usage of health care;
 - 15 outputting cost data based upon various factors including all "in-network" treatment and all "out-of-network" treatment;
 - including said parameters of health plans such as individual and household deductibles, coinsurance and co-payments, individual and household stop-loss provisions, and services covered and not covered;
 - 20 outputting premium and estimated out-of-pocket expenses;
 - providing costs for a "worst-case" scenario;
 - outputting out-of-pocket costs for an individual for particular medical conditions and health events with "in-network" treatment; and
 - outputting out-of-pocket costs for an individual for particular medical
 - 25 conditions and health events with "out-of-network" treatment.

6. A computer-based method of providing comparative cost information for health insurance plans comprising the steps of:
- processing data with a central processing unit;
 - storing data on a mass storage device;

5 storing data and commands in volatile memory;
 incorporating parameters of health plans into stored data;
 assembling recent claims cost data for each health plan and entering them into
 data storage;
 generating claims-level files for a reference population from historical claims
 10 data and entering said files into data storage;
 acquiring user's household members' health and personal information and
 incorporating that information into temporary storage;
 comparing household members health and personal information to reference
 population by processing the data with a central processing unit;
 15 outputting, onto display device, cost data for household members based on
 said comparison, and providing for optional printed output;
 outputting, onto display device, cost data based upon various factors including
 expected very high, high, moderate, low and no usage of health care;
 outputting, onto display device, cost data based upon various factors including
 20 all "in-network" treatment and all "out-of-network" treatment and providing for
 optional printed output;
 including, for display on a display device, said parameters of health plans
 such as individual and household deductibles, coinsurance and co-payments,
 individual and household stop-loss provisions, and services covered and not covered
 25 and providing for optional printed output;
 outputting, on a display device, premium and estimated out-of-pocket
 expenses and providing for optional printed output;
 providing costs for a "worst-case" scenario, for display on a display device
 and providing for optional printed output;
 30 outputting, on a display device, out-of-pocket costs for an individual for
 particular medical conditions and health events with "in-network" treatment and
 providing for optional printed output; and
 outputting, on a display device, out-of-pocket costs for an individual for
 particular medical conditions and health events with "out-of-network" treatment and
 35 providing for optional printed output.

7. A method for calculating optimal flexible savings account contributions
 comprising the steps of: formulating a dynamic numerical model based on a

consumer's objective function; said consumer's objective function further comprising the steps of:

- 5 formulating a utility function;
- incorporating parameters of health plans;
- assembling recent health care use and cost data for a reference population
- acquiring personal and health information from users on themselves and on their household members;
- 10 estimating the distribution of out-of-pocket costs the user and his/her household is likely to face in the coming year in various health plans, based on the experience of comparable households in the reference population;
- calibrating the health transition equation with historical claims data linked to the user's health status;
- 15 solving the numerical model by numerical calculation methods with assigned exogenous parameters and with test values for the preference parameters;
- estimating preference parameters using parameter values which correspond to solutions of the dynamic program which are close to observed historical expenditures of like-situated members of a given health plan,
- 20 inputting an estimate of a user's risk aversion,
- inputting an estimate of the user's income; and
- solving the dynamic programming model by numerical calculation methods for optimal flexible spending account contributions for a particular user in one or more particular health plans (or no health insurance), with assigned exogenous
- 25 parameters and with estimated values for the preference parameters; and outputting the optimal contributions.

8. A computer-based method for calculating optimal flexible savings account contributions comprising the steps of:

- processing data and performing numerical solutions with a central processing unit;
- 5 storing data and computer programs on a mass storage device;
- storing data and commands in volatile memory;
- formulating a consumer's objective function which maximizes expected future utility, namely

$$G, \left\{ m_\varepsilon, c_\varepsilon \right\}_{\varepsilon=-\infty}^{\infty} EU = \int_{-\infty}^{\infty} U(h, c) f(\varepsilon, \theta) d\varepsilon$$

10 where,

G represents the FSA contribution;

$\{m_\varepsilon, c_\varepsilon\}_{\varepsilon=-\infty}^{\infty}$ represents the consumption plan for every possible health shock ε ;

$U(h, c)$ represents the utility of the consumer from health status h and consumption of non-medical goods c ;

15 $f(\varepsilon, \theta)$ is the probability density function of the distribution for health shocks, where θ parameterizes the distribution of health shocks and will depend on the characteristics of the consumer.

9. The method of claim 8 further comprising the step of:
using

$$U(h, c) = \begin{cases} \left((1-\delta)h^\rho + (\delta)c^\rho \right)^{1/\rho} & \text{if } h \geq h_{\min} \\ 0 & \text{if } h < h_{\min} \end{cases}$$

5 as the instantaneous utility function,

where, $\rho < 1$, $\delta \in [0, 1]$ and h_{\min} are the parameters of the utility function.

10. The method of claim 8 further comprising the step of:
using

$$h = f(h_0, m, \varepsilon; \eta)$$

5 as an estimate of the health transition equation,
where ε represents shocks to health in period.

11. The method of claim 8 further comprising the step of:
using

$$\varepsilon \sim F(\varepsilon; \theta) \quad t = 1 \dots 12$$

5 for the probability distribution from which the health shocks are drawn, where ε is assumed normally distributed and where $F(\cdot)$ is the cumulative density function of the distribution of shocks, and θ parameterizes that distribution.

12. The method of claim 8 further comprising the steps for:
 defining a health transition function; and
 defining an asset transition function.

13. The method of claim 8 further comprising the steps for:
 solving the numerical model by dynamic programming methods.

14. A system for providing comparative cost information for health insurance plans comprising;;
 at least one computer comprising a central processing unit, a data entry device, and volatile memory for performing calculations;
 5 a mass storage for storing parameters of health plans and recent claims cost data for health plans, for a reference population;
 claims-level files for said reference population which have been generated by calculations of said computer applied to said recent claims cost data;
 user's household members' health and personal information entered into
 10 computer by said data entry device;
 comparison cost data for household members, output by computer, said data calculated for household members health and personal information, compared to said reference population; and
 output premium and estimated out-of-pocket expense cost data for household
 15 members, output by computer, said data calculated for household members health and personal information.

15. The system as in claim 14 further comprising:
 an output calculated by the computer from costs for a "worst-case" scenario from said personal data and said reference population data.

user's household members' health and personal information provided for storage on said mass storage device by entering data utilizing said data entry device;
 15 household members health and personal information compared to reference population by said central processing unit and output by said central processor to output viewing device;

cost data for household members output to output viewing device, said cost data calculated by said central processing unit based on said comparison and upon
 20 various factors including expected very high, high, moderate, low and no usage of health care, and including "all in-network" treatment and "all out-of-network" treatment;

parameters of health plans such as individual and household deductibles, coinsurance and co-payments, individual and household stop-loss provisions, and
 25 services covered and not covered stored on mass storage device and used for cost data calculations by said central processing unit;

wherein viewable output options for viewing on viewing device include premium and estimated out-of-pocket expenses, costs for a "worst-case" scenario, out-of-pocket costs for an individual for particular medical conditions and health
 30 events with "in-network" treatment, and out-of-pocket costs for an individual for particular medical conditions and health events with "out-of-network" treatment.

19. A system for calculating optimal flexible savings account contributions comprising:

- at least one computer;
- an algorithm for estimating the optimal flexible spending account contribution
 5 which includes
 - a consumer's objective function;
 - an instantaneous utility function;
 - a residual utility function;
 - a health transition equation;
 - 10 a transition equation for assets;
 - a transition equation for total medical expenditure;
 - exogenous parameters which have assigned values;
 - preference parameters which have initially assigned test values;

- said health transition equation calibrated with historical claims data
- 15 linked to the user's status;
- said algorithm forming a dynamic programming model which is solved by numerical calculation methods with assigned exogenous parameters and with test values for the preference parameters;
- estimated preference parameters using parameter values which correspond to
- 20 solutions of the dynamic program which are close to observed historical expenditures of like-situated members of a given health plan; and
- a solution of the dynamic programming model by numerical calculation methods for optimal flexible account contribution for a particular user with assigned exogenous parameters and with estimated values for the preference parameters.

20. A computer-based system for calculating optimal flexible savings account contributions comprising:

- a central processing unit for processing data and performing numerical solutions;
- 5 a mass storage device for storing data and computer programs;
- volatile memory for storing data and commands;
- a numerical model comprising wherein:
- a consumer's objective function which maximizes expected future utility,

$$\max_{G, \{m_\varepsilon, c_\varepsilon\}_{\varepsilon=-\infty}^{\infty}} EU = \int_{-\infty}^{\infty} U(h, c) f(\varepsilon, \theta) d\varepsilon$$

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where,

G represents the FSA contribution;

$\{m_\varepsilon, c_\varepsilon\}_{\varepsilon=-\infty}^{\infty}$ represents the consumption plan for every possible health shock ε ;

$U(h, c)$ represents the utility of the consumer from health status h and

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consumption of non-medical goods c ;

$f(\varepsilon, \theta)$ is the probability density function of the distribution for health shocks,

where θ parameterizes the distribution of health shocks and will depend on the characteristics of the consumer.

an instantaneous utility function;

- 20 a residual utility function;
a health transition equation;
a transition equation for assets;
a transition equation for total medical expenditure;
values assigned to exogenous parameters;
25 test values assigned to preference parameters;
the health transition equation calibrated with historical claims data
linked to the user's status;
said numerical model solved by using numerical methods on the
central processing unit, utilizing data stored on the mass storage device and in volatile
30 memory, said solution being the optimal flexible spending plan contribution.

21. The system as in claim 20 further comprising:

$$U(h_c) = \begin{cases} ((1-\delta)h^\rho + (\delta)c^\rho)^{1/\rho} & \text{if } h \geq h_{\min} \\ 0 & \text{if } h < h_{\min} \end{cases}$$

as the instantaneous utility function,

where, $\rho < 1$, $\delta \in [0,1]$ and h_{\min} are the parameters of the utility function.

22. The system of claim 20 further comprising:

$$h_t = f(h_{t-1}, m_t, \varepsilon_t; \eta)$$

$h_t = f(h_{t-1}, m_t, \varepsilon_t)$ as an estimate of the health transition equation,

where ε_t represents shocks to health in period t .

23. The system of claim 20 further comprising:

$$\varepsilon \sim F(\varepsilon; \theta) \quad t = 1 \dots 12$$

as the probability distribution from which the health shocks are drawn, where ε is assumed normally distributed and where $F(\cdot)$ is the cumulative density function of the distribution of shocks, and θ parameterizes that distribution; and

- 5 calculating θ by dynamic programming.

24. The method of claim 20 further comprising:

a health transition function; and
an asset transition function.

25. The method of claim 20 further comprising:
dynamic programming as the numerical method for solving the numerical
model.

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